

Lesson 17

Installing and Configuring Printers Part 2

- **Printer Interfaces**
 - Hardware Interface
 - Interface Software
- **Printer Supplies**
 - Printer media (what you print on)
 - Printer consumables (what you print with).
- **Options/Upgrades**
- **Installing Printers**(USB , local ,network)
- **Configuring a printer**
 - Priority
 - Schedule
 - Spool settings
 - Driver
 - Print Test Page
 - Sharing

Printer Interfaces

- printer's *interface is the collection of hardware and software that allows the printer to communicate with a computer.*

1-Hardware Interface

- The hardware interface is commonly called a port.
- Each printer has at least one interface, but some printers have several, in order to make them more flexible in a multiplatform environment.



Communication Types

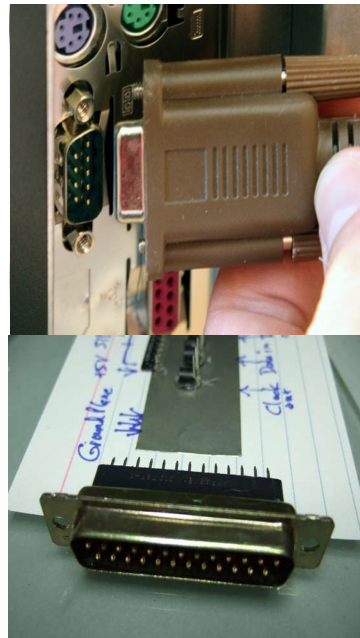
- When we say *communication types*, we're talking about the ports used in getting the printed information from the computer to the printer.

There are eight major types:

1. Serial
2. Parallel
3. SCSI
4. Universal Serial Bus (USB)
5. Network
6. IEEE 1394b
7. Infrared
8. Wireless.

1-Serial

- When computers send data serially, they send it one bit at a time, one after another.
- slow data transmission speed
- you must set the communication parameters (baud, parity, start and stop bits) on both entities in this case, the computer and its printer(s)—before communication can take place.
- Serial cables, which aren't very popular for printers, use either a 9-pin or 25-pin connector.*
- The maximum length of a serial cable is 25 feet long.
- not susceptible to data skew.



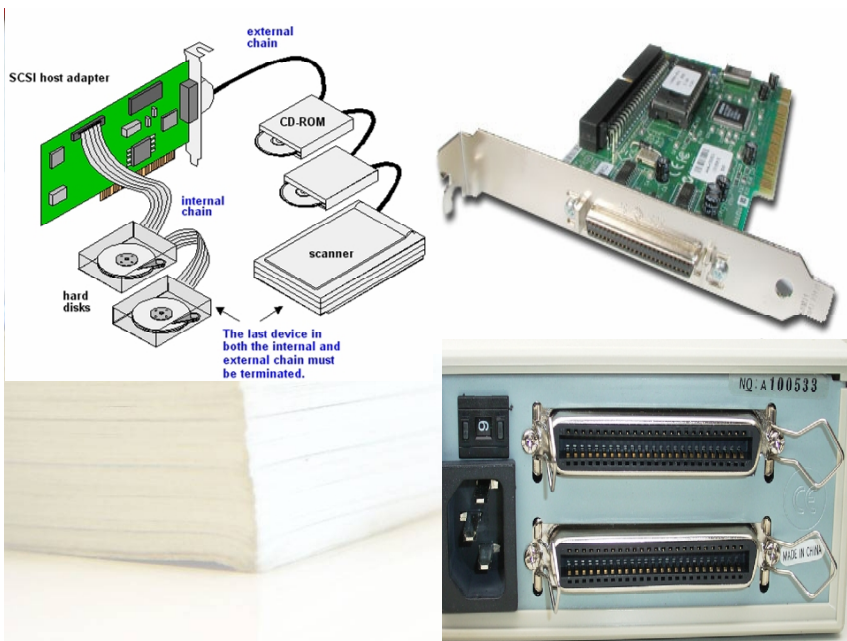
2- Parallel

- parallel communication, is receiving data 8 bits at a time over eight separate wires (one for each bit).
 - Parallel communication was the most popular way of communicating from computer to printer for many years,
 - The maximum length of a parallel cable is 10 feet long — any longer and the cable runs the risk of
- 1. Crosstalk**
is electrical interference from other equipment, fluorescent lights, and other cables.
 - 2. Data skew**
is the concept of the signals that travel down the different wires in the parallel cable not traveling at the same speed and thus arriving at the destination at different times.
This results in the data being unreadable at the opposite end.



3- SCSI

- Only a few types of printers use SCSI interfaces to the PC, and most of them are laser printers, dye-sublimation printers.
- **The benefits in these situations were as follows:**
- There could be more than one device on a single SCSI connection through daisy chaining.
- It was fairly simple to implement.
- It had relatively large throughput compared to other interfaces of the time.
- Because of the advent of higher-speed peripheral connection methods, such as IEEE 1394b/FireWire and USB, SCSI interfaces for printers are all but obsolete.



4-Universal Serial Bus (USB)

- Most printers today that are purchased for home or small-office use are USB printers, meaning that they connect to the computer via a USB port.
- **The following are some key points to remember about USB:**
- 1. It is Plug and Play.
- 2. You may connect 127 devices to a USB chain.
- 3. You don't need to configure ports, IRQs, or DMA channels for each device.
- 4. USB 2.0 has a transfer rate of 480 Mbps.



5- Network

- Many newer printers (primarily laser and LED printers) have a special interface that allows them to be hooked directly to a network.
- These printers have a network interface card (NIC) and ROM-based software that allow them to communicate with networks, servers, and workstations.
- The most common interface you'll see is RJ-45 for an Ethernet connection.
- **There are a couple of advantages to a network-based printer:**
 1. The network printer is available all the time.
 2. Dedicated print servers are not required.



6-IEEE 1394b FireWire

- This interface currently supports devices with a maximum throughput of 800MBps and is capable of speeds up to 3.2Gbps, so more and more devices that need to send a lot of data in a short period of time will use this interface.
- Printers used for tasks such as graphics and typesetting that need to receive hundreds of megabytes of camera-ready art and graphics have IEEE 1394b ports.
- Not many home printers use IEEE1394b, however, because it is an extra feature most people wouldn't use and thus don't want to pay for it.



7- Infrared

- Connecting your printer to a system by using infrared technology lets your computer (or PDA) communicate wirelessly with the printer in much the same way that your TV remote lets you change channels without getting off the sofa.
- The infrared signal that is sent from the computer to the printer is carried as a beam of light, instructing the printer what to print.
- In order to use an infrared printer, you need both an infrared transmitter/receiver connected to your computer and an infrared printer.
- Today, most computers have an infrared port (transmitter) built-in, especially on laptop systems.
- Desktop computers normally have a USB device that is installed to give an infrared transmitter.



8-Wireless

1. Some printers have built-in 802.11 interfaces
 2. hooked to 802.11 bridges with their built-in network cards.
 3. *Bluetooth. Bluetooth is a wireless technology that is used to replace the myriad of interface cables that run between your computer and all its peripherals.* most devices are specified to work within 10 meters (33 feet). Printers such as the HP DeskJet 450wbt mobile printer have Bluetooth capability.
- When printing with a Bluetooth-enabled device (like a PDA or cell phone) and a Bluetooth enabled printer, all you need to do is get within range of the device (that is, move closer), select the print driver from the device, and choose Print.



HP Bluetooth Printer Adapter

2- Interface Software

- Allow Computers and printers to talk to each other
- It translate software commands into commands the printer can understand.
- **There are two factors to consider with interface software:**
 1. the page-description language
 2. the driver software.

1- Page-Description Language (PDL)

- PDL is simply a means of coding every aspect of a printed document into a data stream that can be transmitted to the printer.
- Determines how efficient the printer is at converting the information to be printed into signals the printer can understand.
- it describes the whole page being printed by sending commands that describe the text as well as the margins and other settings.
- A language for describing the layout and contents of a printed page.
- Hewlett Packard's Printer Control Language ([PCL](#)) and Adobe's [PostScript](#) are the two most commonly used PDLs.

PCL vs. Postscript

PCL

- PCL is a page description language that was developed by Hewlett Packard for use in its printers in the early 1980s.
- used widely by many different printer manufacturers and supported by many different Operating Systems and Not supported in most Macintosh environments

Postscript

- PostScript is a page description language that was developed by Adobe and first introduced in the Apple LaserWriter printer in 1985.
- used widely by many different printer manufacturer.
- It is used heavily in Macintosh platforms and for graphic applications in several platforms.

PCL vs. Postscript

PCL

- Fast print processing.
PCL drivers do most of the rendering on the local workstation and the information is sent in essentially binary form to printer.
Postscript drivers essentially send a page description to the printers where it is rendered.

Since local workstations are generally MUCH faster than the printers, PCL printing is much faster than postscript and because it requires less printer memory some jobs may only print if sent using PCL drivers.

Postscript

- Graphical objects are often more detailed
PCL is also a simpler language than Postscript so it lacks many of the complex drawing and scaling functions that are available in Postscript.
- Ps sends images to the printer as geometrical objects rather than bitmaps.
Therefore, if you are using a package which takes advantage of postscript's capabilities (e.g. most Adobe products and some others), you may get better quality output using postscript drivers and your complex print job may not print properly or at all using the PCL driver.

PCL vs. Postscript

PCL

- PCL is device dependent.
- This means that the drivers for this language utilize the printer hardware for creating some of the printed data, usually graphics data such as fill areas, underlines or fonts.
This allows the computer to process the print job quickly and efficiently. The printer is then responsible to complete the creation and processing of page data. Individual printers may perform these tasks differently giving you a slightly different output.

Postscript

- Postscript is device independent.
This means that the Postscript language creates all of the print data and does not rely on the printer for print data. This allow the output to be consistent when printed on more than one type of printer or print device.
the Print Manager translates the print job into a PostScript program - a mathematical representation of the page - and sends it to the PostScript device. Once the PostScript code is received by the printer, it is translated by the PostScript interpreter. This converts the mathematical page description into a bitmap (dot pattern) at the printer's native resolution.
This PostScript interpreter is basically a program stored in the printer's ROM

- If your file is not printing correctly using one driver, go ahead and try the other.
- It is very important that you use the correct interface software for your printer.
- Using a PCL driver while printing to a PostScript (PS) printer will produce no output.
- Using a PostScript (PS) driver to print to a PCL printer will produce hundreds of pages of output with random graphical characters.

2- Driver Software

- The printer driver provides the software interface between the printer and your application or operating system.
- The primary function of the driver is to inform the PC about the capabilities of the printer, such as the PDLs it uses, the types of paper it handles, and the fonts installed.
- When you print a document in an application, the print options you select are supplied by the printer driver, although they appear to be part of the application.
- When you need to print, you select the printer driver for your printer from a preconfigured list.
- The driver you select has been configured for the type, brand, and model of printer as well as the computer port to which it is connected.
- You can also select which paper tray the printer should use, as well as any other features the printer has (if applicable).
- Also, each printer driver is configured to use a particular page-description language.



Printer Supplies



Printer Supplies

The printer supplies include

1. Printer media (what you print on)

The *print media* is what you put through the printer to print on.

- i. Paper
- ii. Labels
- iii. Transparencies

2. Printer consumables (what you print with)

Besides print media, other things in the printer run out and need to be replenished. These items are the *print consumables*.

- I. Ink
- II. Toner



Printer media



Paper

- Several aspects of paper can be measured each gives an indication as to the paper's quality.

1. *Composition*

- Cotton (called rag stock.)
- wood pulp (cheaper).
- combination of the two.

2. *basis weight*

International: Weight of paper expressed in 'grammage' grams per square meter (gsm or g/m²).

US: The basis weight of a paper is the designated fixed weight of 500 sheets, measured in pounds, in that paper's basic sheet size(17x22). Manufacturers divide the standard size into four sheets, resulting in the 8.5x11 size

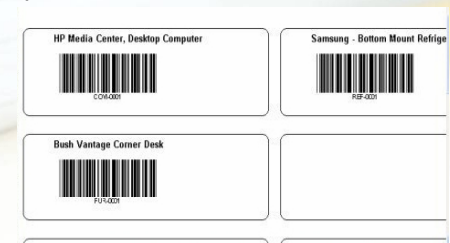
So a ream of 500 sheets of 20 lb. bond paper weighs 5 pounds.

3. caliper (or thickness)

- If the paper is too thick, it may jam
- If the paper is too thin may not feed at all.
- *You should check the documentation of your printer will give specifications for the paper that should be used in that printer.*
- For best results, store paper in an area where it will not get wet or be exposed to excessive humidity.
- For best results with any printer, buy the paper that has been designated specifically for that printer by the manufacturer. It will be more expensive,

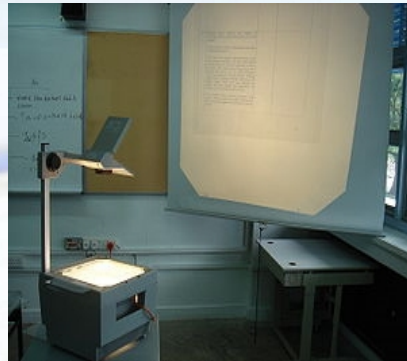
Labels

- From the printer's perspective, labels are just another type of paper.
- But because of their thickness and occasional tendency to peel off before you want them to, they can cause problems.
- Always make sure that the labels you are using are meant to be put into the type of printer you are using.
- In addition, if you notice any peeling labels, discard the sheet to avoid a likely jam in your printer.



Transparencies

- Transparencies are still used for presentations made with overhead projectors
- Special transparencies were developed for use with laser and bubble-jet printers.
- Each type of transparency was designed for a particular brand and model of printer.
- Again, check the printer's documentation to find out which type of transparency works in that printer.
- Don't use any other type of transparency!



Printer consumables

Ink

- Printers use several different colors of ink,
- Both dot-matrix printers and bubble-jet printers use ink, but with different methods.
- It is possible to re-ink a ribbon.
- *Do not use ink cartridge refill kits!*
- **These kits (have several problems.**
- First, the kits don't use the same kind of ink that was originally in the ink cartridges.
The new ink may be thinner, causing the ink to run out or not print properly.
- Also, the printhead is supposed to be replaced around this same time. Refilling the cartridge doesn't replace the printhead, so you'll have print-quality problems.
- Finally, the hole the syringe leaves cannot be plugged and may allow ink to leak out.

Toner

- Each model of laser printer uses a specific toner cartridge. You should check the printer's manual to see which toner cartridge it needs.
- refilling the toner means you're not replacing the photosensitive drum
- *Bad printer quality.*

Always recycle your used ink and toner cartridges! Just don't buy recycled cartridges.

Options/Upgrades

Options/Upgrades

- Most printers (especially laser printers) can be upgraded with different capabilities.
This is done to add functions or to increase the printing capacity of a printer.
- Each manufacturer, with the documentation for each printer, includes a list of all the accessories, options, and upgrades available for that printer.
- **These options include the following:**
 1. Memory
 2. Hard drives
 3. Print server with a network card interface
 4. Trays and feeders
 5. Finishers
 6. Scanners, fax modems, and copiers

Memory

- add memory to it to increase its buffer size.
- The larger the buffer, the larger a print job it can handle.
- So, by adding memory, you can increase the performance of a printer.
- For the most part, printer memory is specific to the make and model of printer being upgraded.
- You can check with the manufacturer of your printer to see what kind of memory it takes and how best to upgrade it.
- The procedures are slightly different for each make and model of printer.

Hard Drives

- In order to print properly, the type style or *font being printed must be downloaded to the printer* along with the job being printed.
- Desktop-publishing and graphic-design businesses that print color pages on slower color printers are always looking for ways to speed up their print jobs. So they install multiple fonts into the onboard memory of the printer to make them *printer-resident fonts*.
- But there's a problem: most printers have a limited amount of storage space for these fonts.
- To solve this problem, printer manufacturers made it possible for hard drives to be added to many printers. These hard drives can be used to **store many fonts used during the print process** and are also used to **store the large document file** while it is being processed for printing.

Print Server with a Network Interface Card

- print server (with a network interface card [NIC]) option for a printer became popular as more and more people needed their printers to be on the network without the need for a host computer (slow, must be opened).
- The NIC in a printer is similar to the NIC in a computer, with a couple of important differences.
- First, the NIC in a printer has a small processor on it to perform the management of the NIC interface (functions that the software on a host computer would do).
- Second, the NIC in a printer is proprietary, for the most part. It is made by the same manufacturer as the printer.

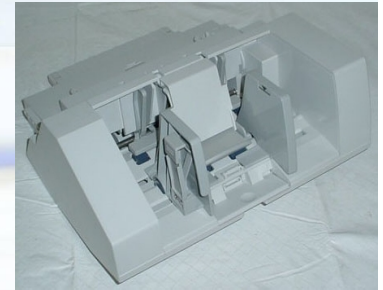
Trays

- Most laser and bubble-jet printers come with at least one paper tray (usually 500 sheets or less).
- The addition of a paper tray allows a printer to print **more sheets** between paper refills, thus reducing its operating cost. In addition, some printers can accommodate multiple paper trays, which can be loaded with **different types of paper**, stationery, and envelopes. The benefit is that you can print a letter and an envelope from the same printer **without having to leave your desk** or change the paper in the printer.



Feeders

- Some types of paper products need to be watched as they are printed, to make sure the printing happens properly.
- One example is envelopes: you usually can't put a stack of envelopes in a printer, because they won't line up straight or may get jammed.
- An accessory that you might add for this purpose is the envelope feeder.
- An envelope feeder typically attaches to the front of a laser printer and feeds in envelopes, one at a time. It can hold usually between 100 and 200 envelopes.



finisher

- A printer's *finisher* does just what it says: it finishes the document being printed.
- It does this by folding, stapling, hole punching, sorting, or collating the sets of documents being printed into their final form.



HP LaserJet 9040

Scanners, Fax Modems, and Copiers

- By adding these two accessories, you can turn your simple printer into a home office copier capable of sending faxes as well. In this age of home offices, such devices are becoming commonplace.



Installing and Configuring Printers

Installing a USB printer in Windows XP or Vista

1. Turn on the computer.
2. Plug in the printer and turn it on.
3. Insert the CD into the computer's CD-ROM drive. The driver CD's auto-run should automatically start the installation program. If not, Start → Run and type in D:\setup or D:\install (if your CD-ROM drive letter is different, substitute that letter for D).
4. Follow the prompts in the installation program to install the driver.
5. Once the software has been installed, plug one end of the USB cable into the printer and the other end into the free USB port. Some installation programs will prompt you for this step.
6. 6. Windows will automatically detect the new printer, install the driver, and configure it automatically. Windows will display a balloon in the lower-right corner of the screen
7. saying "Your hardware is now installed and is ready to use."
8. Print a test page to see if the printer can communicate and print properly.

Printer Installation Procedures

1. Attach the device using a local or network port and connect the power.
2. Install and update the device driver and calibrate the device.
3. Configure options and default settings.
4. Print a test page.
5. Verify compatibility with the operating system and applications.
6. Educate users about basic functionality.

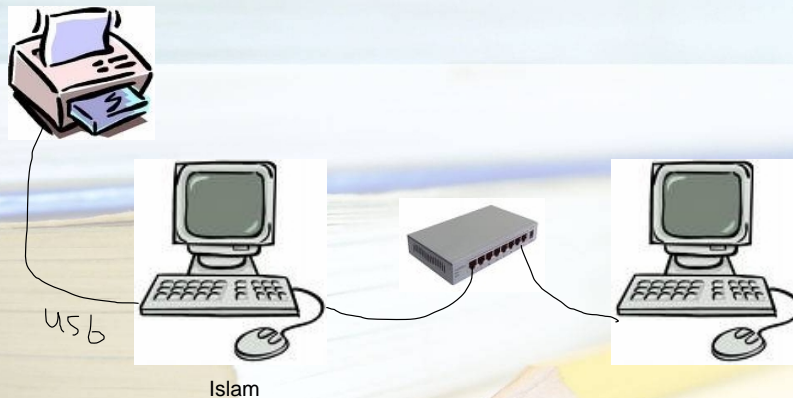
Calibration

- is a technique that helps a printer function efficiently.
- Printer calibration is the process of making the printed image match the image shown on a [computer](#) display.
- Think of calibrating a printer as achieving what-you-see-is-what-you-get printing.
- A computer display and a printer don't always produce the same image for a few different reasons.
 1. print ink dots naturally overlap a little bit on the paper, while the [pixels](#) on displays do not overlap.
 2. printers commonly create images slightly darker than computer displays.
 3. printers mix four pigments to create colors (cyan, magenta, yellow, and black), while displays contain pixels of three colors (red, green, and blue).
 4. different types of paper will affect the final printed image, whereas displays don't have such issues.
- It eliminates discoloration on the page, removes overlapping words, increases the vibrancy of colors and helps distribute ink properly on the paper. Calibration also helps the printer adjust the resolution and texture to give a harmonious result.

Sharing Printer Resources

- **Choose Start Printers and Faxes.**
- **Right-click the printer you want to share and choose Sharing.**
- **Select Share This Printer and type the name of the share.**
- **Click OK.**

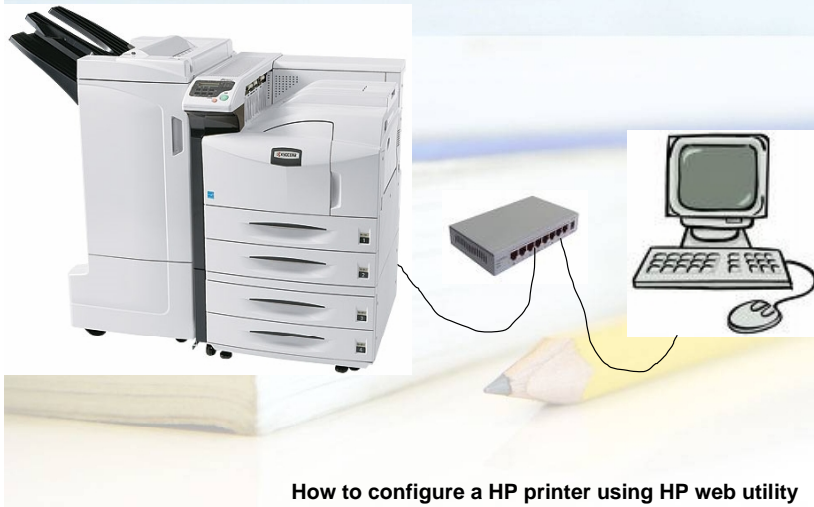
Configure network printer



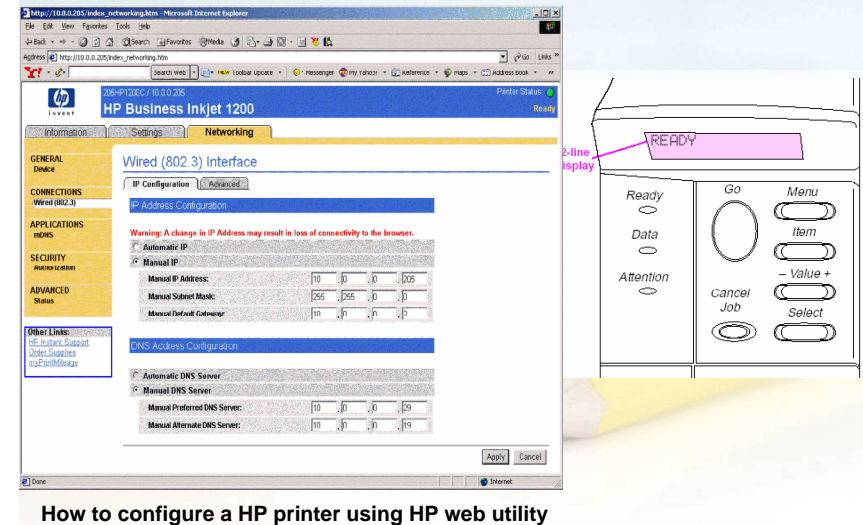
Installing a network printer by using Point and Print

- Point and Print is a feature that copies the printer driver from one system to another as soon as you connect to the printer no matter how you connect to the printer! What method is quickest to connect to the printer? Using the UNC path in the Run command!
- **Choose Start Run.**
- **Type \\computername\PrinterShareName, where *computername* is the name of the system that is sharing the printer, and *PrinterShare Name* is the name of the shared printer.**
- **When asked if you wish to install the printer, click Yes.** The printer is now installed and ready to print to

Configure network printer



Configure network printer



Configuring a printer

- Priority
- Schedule
- Spool settings
- Driver
- Print Test Page

Priority

- If a group of users needs to have a higher priority on a print device over others on the network, you could install two printers to refer to the same print device.
- After you have both printers installed, set the priority of one of the printers higher than the other anyone's print jobs sent to that printer will have a higher priority on the print device.
- You can set the priority of a printer on the Advanced tab of the printer's Properties dialog box

Schedule

- If you have a group of users that should be printing only at certain hours, you could set the schedule of the printer so that it can print only during those times.
- The user can send print jobs to the printer and the printer will queue the job, or store it, until the scheduled time.
- At the scheduled time, it will then print the job.

Spool settings

- In Windows, when a user chooses to print a document, the print job creates a temporary file on the disk for the document being printed.
- After the file is stored on disk, the user gets control of the application and the system sends the temporary file to the print device to be printed. While the temporary file is sent to the print device, the user gets to use his or her program again.
- This is sometimes referred to as background printing where the user thinks the print job has been sent, but in actual fact the print job is being sent while the user continues using the computer.
- The purpose of this process, called spooling, is so that users can continue using the computer instead of waiting for the 20 pages to actually get sent to the print device.
- Because temporary files are stored on the disk when spooling is enabled (which is the default with all Windows printers), if you don't have the hard disk space on your computer to store the temporary files, you won't be able to print. If you get a spooling error, you may turn off spooling by choosing Print Directly to the Printer on the Advanced tab.

Driver

- If the driver goes corrupt for your printer, you may want to change the driver.
- To change the driver for a printer, go to the Advanced tab of the printer's Properties dialog box and click the New Driver button.
- You will then be asked for the make and model of the printer.

Print Test Page:

- If you run into trouble with a printer, you may want to print a test page by going to the Properties dialog box of a printer and choosing the General tab.
- On the General tab, click Print Test Page. Printing a test page will help you determine if you are having a problem with the printer or a problem with an application.
- For example, if you cannot print from Microsoft Word but you can print a test page then there is a setting in Microsoft Word that is causing the printing problems.

Sharing:

- If you're in a networked environment, you can share the printer so that other users on the network can print to it from their computers.
- To share the printer, go to the properties of the printer and click the Sharing tab. Select the Share This Printer option and give the printer a share name .

TIP

- Before installing any device, read your device's installation instructions.
- There are exceptions to every rule.

اللهم انفعني بما علمتني
و علمني ما ينفعني
وارزقني علما ينفعني